Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A noise suppressing method comprising:

dividing an input light including a signal light and noise light within a signal wavelength band of the signal light into a first component with a first polarization direction parallel to a polarization direction of the signal light and a second component with a polarization direction orthogonal to the first polarization and applying the first component to a first arm and the second component to a second arm;

shifting an optical phase of the second component in the second arm so that the optical phase of the second component in the second arm differs by π from the first component in the first arm;

combining the first component output from the first arm and the second component output from the second arm to cause the noise lights included in the first and second components to interfere with each other; and

adjusting the polarization of the second component in the second arm to maximize a SNR of the combined light by the combining ~~step~~ the first component output,

wherein the adjusting the polarization of the second component in the second arm measures a degree of polarization of the combined light and adjusts the polarization direction of the second component in the second arm to maximize the degree of polarization.

2. (Currently Amended) The method of claim 1 wherein the polarization-dividing ~~step~~ comprises:

detecting an intensity of a base repetition frequency component out of the first component in the first arm; and

adjusting the polarization of the signal light to increase the intensity of the base repetition frequency component.

3. (Currently Amended) The method of claim 1 wherein the polarization-dividing ~~step~~ comprises:

extracting a light within the signal wavelength band from the input light;

detecting an intensity of the base repetition frequency component out of the first component in the first arm; and

adjusting the polarization of the extracted light to increase the intensity of the base repetition frequency component.

4. (Currently Amended) The method of any one of claims 1 through 3 wherein the optical phase shifting ~~step shifts~~ comprises shifting the optical phase of the second component in the second arm according to its wavelength using a spectral delay having a delay amount that differs according to a wavelength.

5. (Canceled).

6. (Currently Amended) A noise suppressing method comprising:

dividing an input light including a signal light and noise light within a signal wavelength band of the signal light into a first component with a first polarization direction parallel to a polarization direction of the signal light and a second component with a polarization direction orthogonal to the first polarization and applying the first component to a first arm and the second component to a second arm;

shifting an optical phase of the second component in the second arm so that the optical phase of the second component in the second arm differs by π from the first component in the first arm;

combining the first component output from the first arm and the second component output from the second arm to cause the noise lights included in the first and second components to interfere with each other; and

adjusting the polarization of the second component in the second arm to maximize a SNR of the ~~combined~~ light combined by the combining ~~step~~,

wherein the adjusting the polarization of the second component in the second arm ~~step~~ extracts the component with the polarization orthogonal to the polarization direction of the signal light included in the combined light, from the combined light and adjusts the polarization of the second component in the second arm to maximize the intensity of the extracted component.

7. (Canceled).

8. (Currently Amended) A noise suppressing method comprising:

dividing an input light including a signal light and noise light within a signal wavelength band of the signal light into a first component with a first polarization direction parallel to a polarization direction of the signal light and a second component with a polarization direction orthogonal to the first polarization and applying the first component to a first arm and the second component to a second arm;

shifting an optical phase of the second component in the second arm so that the optical phase of the second component in the second arm differs by π from the first component in the first arm;

combining the first component output from the first arm and the second component output from the second arm to cause the noise lights included in the first and second components to interfere with each other;

dividing the ~~combined~~ light combined by the combining ~~step~~ into a third component with a polarization parallel to the polarization direction of the signal light included in the combined light and a fourth component with a polarization orthogonal to the polarization direction of the third component;

converting each of the third and fourth components into a first and a second electric signal, respectively;

detecting the intensity of a base repetition frequency component of the signal light out of the first electric signal of the third component;

detecting the intensity of a low frequency component out of the second electric signal of the fourth component;

controlling the polarization direction of the first component in the first arm to maximize the intensity of the base repetition frequency component; and

controlling the polarization direction of the second component in the second arm to minimize the intensity of the low frequency component.

9. (Currently Amended) A noise suppressor comprising:

a polarization divider to divide an input light including a signal light and a noise light within a signal wavelength band of the signal light into a first component with a polarization parallel to a polarization direction of the signal light and a second component with a polarization orthogonal to the polarization direction of the first component and to apply the first component to a first arm and the second component to a second arm;

an optical phase shifter disposed in the second arm to shift the optical phase of the second component in the second arm so that the optical phase of the second component in the second arm differs by π from the first component in the first arm;

a combiner to combine the first component output from the first arm and the second component output from the second arm to cause the noise lights included in the first and second components to interfere with each other; and

a second polarization adjuster to adjust the polarization of the second component in the second arm to maximize a SNR of the combined light from the combiner,

wherein the second polarization adjuster comprises a polarization controller disposed in the second arm to control the polarization of the second component, and a controller to measure a degree of polarization of the combined light from the combiner and to control the polarization controller to maximize the degree of polarization.

10. (Previously Presented) The apparatus of claim 9 wherein the polarization divider comprises:

a base repetition frequency component intensity detector to detect an intensity of a base repetition frequency component out of the first component in the first arm; and

a polarization adjuster to adjust the polarization of the signal light to increase the intensity of the base repetition frequency component.

11. (Previously Presented) The apparatus of claim 9 wherein the polarization divider comprises:

an optical bandlimit filter to extract a signal wavelength band of the signal light from the input light;

a base repetition frequency component intensity detector to detect an intensity of a base repetition frequency component out of the first component in the first arm; and

a polarization adjuster to adjust the polarization of the output light from the optical bandlimit filter to increase the intensity of the base repetition frequency component.

12. (Original) The apparatus of claim 9 wherein the optical phase shifter comprises a spectral delay having a delay amount which differs according to a wavelength, and an optical circulator to apply the second component in the second arm to the spectral delay and to return the output light from the spectral delay into the second arm.

13. (Canceled).

14. (Currently Amended) A noise suppressor comprising:

a polarization divider to divide an input light including a signal light and a noise light within a signal wavelength band of the signal light into a first component with a polarization parallel to a polarization direction of the signal light and a second component with a polarization orthogonal to the polarization direction of the first component and to apply the first component to a first arm and the second component to a second arm;

an optical phase shifter disposed in the second arm to shift the optical phase of the second component in the second arm so that the optical phase of the second component in the second arm differs by π from the first component in the first arm;

a combiner to combine the first component output from the first arm and the second component output from the second arm to cause the noise lights included in the first and second components to interfere with each other; and

a second polarization adjuster to adjust the polarization of the second component in the second arm to maximize a SNR of the combined light from the combiner,

wherein the second polarization adjuster comprises a polarization controller disposed in the second arm to control the polarization of the second component and a controller to extract a component with a polarization orthogonal to the polarization direction of the signal light included in the combined light out of the combined light from the combiner and to control the polarization controller so as to minimize the optical intensity of the extracted component.

15. (Canceled).

16. (Currently Amended) A noise suppressor comprising:

a polarization divider to divide an input light including a signal light and a noise light within a signal wavelength band of the signal light into a first component with a polarization parallel to a polarization direction of the signal light and a second component with a polarization orthogonal to the polarization direction of the first component and to apply the first component to a first arm and the second component to a second arm;

an optical phase shifter disposed in the second arm to shift the optical phase of the second component in the second arm so that the optical phase of the second component in the second arm differs by π from the first component in the first arm;

a combiner to combine the first component output from the first arm and the second component output from the second arm to cause the noise lights included in the first and second components to interfere with each other;

a first polarization controller disposed in the first arm to control the polarization of the first component;

a second polarization controller disposed in the second arm to control the polarization of the second component;

a polarization beam splitter to split the combined light from the combiner into a third component with a polarization parallel to the polarization direction of the signal light included in the combined light and a fourth component with a polarization orthogonal to the polarization direction of the third component;

an optoelectric converter to convert each of the third and fourth components into a first and a second electric signal, respectively;

a bandpass filter to detect the intensity of a base repetition frequency component of the signal light out of the first electric signal of the third component;

a lowpass filter to detect the intensity of a low frequency component out of the second electric signal of the fourth component; and

a controller to control the first polarization controller to maximize the intensity of the base repetition frequency component and to control the second polarization controller to minimize the intensity of the low frequency component.

17. (Previously Presented) The apparatus of claim 9 further comprising a phase plate to rotate polarization.

18. (Previously Presented) The apparatus of claim 17 wherein the phase plate is disposed in the first arm.

19. (Previously Presented) The apparatus of claim 17 wherein the phase plate is disposed in the second arm.